REMARKS

Claims 1 – 10 and 12 – 20 remain as originally or previously presented. Claims 11 and 21 were cancelled earlier. Claims 22 – 28 remain withdrawn as they are to a non-elected invention.

Claims 1 – 3, 6 – 14, and 17 – 20 have been rejected under 35 USC §102(b) as being anticipated by Matsui et al (U.S. Patent No. 4,996,182). The Examiner argues that Matsui discloses a multilayer oriented thermoplastic composite for use in printing devices, which can include all of the limitations of the present claims. The Examiner finds that as Matsui discloses a multilayer oriented thermoplastic composite with equivalent layers as the claimed invention, it would be inherent for the composite to have a secant modulus as in instant claims 1, 7, 12 and 17. Further, the Examiner points out that recitation of a newly disclosed property does not distinguish over a reference disclosure of the article or composition claims and that Applicant bears the responsibility for proving the reference composition does not possess the characteristics recited in the claims. However, modulus is not a newly disclosed property. Modulus is discussed and illustrated in the specification and Figure 2 of the drawings of the reference and is a relevant property relied upon in the characterization of almost all thermoplastic films.

At its simplest, modulus is defined as stress over strain. Every film (in fact, every material) has its own stress/strain curve. Imagine gripping a length of plastic wrap from the kitchen at each end and pulling. Initially the film will stretch and if you release one end it will relax back to its initial size. This is the initial modulus, also called the modulus of elasticity or the Young's modulus. If, however, you keep pulling, eventually

the polymer chains that make up the film will start to flow past each other. If you then release one end the film will relax somewhat but it will not relax back to its original configuration. You've stretched it out of shape, so to speak. You've passed the elastic or proportional limit of the film. Now, imagine graphing this exercise. The stress you applied to the film by pulling can be defined as force over area of the film. The strain can be defined as the change in the length of the film. The initial pulling or stress, which results in complete recovery if you stop, is a straight line on the graph with strain increasing proportionally with stress. Along that line stress over strain is always the same and that is the modulus of elasticity or Young's modulus. After the elastic or proportional limit has been met the stress/strain curve is no longer a straight line. The curve drops off. Imagine that piece of plastic wrap again. Once you pull it past the elastic limit, it thins out, it's easier to pull. Attached is a typical stress/strain curve for a polymer taken from Polymer Science and Technology, Joel R. Fried, 1995, Prentice Hall PTR, pg.167, showing the initial, straight line portion of the curve followed by the dropping off of the curve after the polymer has reached its proportional limit. Also shown on this curve is the 1% secant modulus, which is the term used to define modulus in the present specification and claims. The 1% secant modulus is simply the ratio of stress to strain when the film has elongated 1%. In the attached curve, this 1% elongation is reached well after the elastic or proportional limit of the polymer. For particularly elastic films such 1% elongation may occur prior to reaching elastic limit. For these films Young's modulus and 1% secant modulus are equal. However, most useful films are more resilient to deformation. Thus, they have a stress-strain curve that looks like the

attached curve. The 1% secant modulus is on a line with a lesser slope than the initial or Young's modulus. Thus, we can approximate that the 1% secant modulus of a film will always be equal to or less than the Young's modulus of that same film. As was discussed in the Office Action response of September 28, 2007, Figure 2 of the Matsui patent shows the Young's modulus of the film as a function of cavity content. At the lowest workable cavity content according to Matsui the film has a Young's modulus in the machine direction of approximately 102 kg/mm^2 (145,000 psi). Thus, we know from the above discussion that the 1% secant modulus is 145,000 psi or less. And, according to Figure 2, the modulus goes down as the cavity content increases. Thus, it is submitted that the Applicant has proven the reference composition does not possess the characteristics recited in the claims, i.e., Matsui does not disclose a film having a 1% secant modulus in the machine direction of at least 150,000 psi.

With respect to the Examiner's contention that a composite of a similar layer-by-layer construction would necessarily have the same modulus, Applicant respectfully disagrees. One must consider more than the composition of the composite in order to determine its modulus. The present claimed composites have been oriented and then heat set. With the Young's modulus values reported in the Matsui reference one must consider the likelihood that those films have not been heat set. Regardless, clearly they do not meet the modulus requirements of the present claims. Thus, it is requested that the Examiner reconsider and withdraw the present rejection.

Claims 4 – 5 and 15 – 16 have been rejected under 35 USC §103(a) as being unpatentable over Matsui et al (U.S. Patent No. 4,996,182). The Examiner argues

that although Matsui does not specifically disclose the multilayer composite thickness as in the present claims, Applicant fails to disclose any criticality with respect to the recited thicknesses, such that it would be obvious to one of ordinary skill in the art to optimize the composite because discovering the optimum or workable range involves only routine skill in the art. The Examiner further argues that there is no clear teaching away from the claimed thickness of the composite material by Matsui, as the reference does not exclude any thicknesses for the composite material. However, as discussed above, it has been shown that Matsui does not disclose a film having a 1% secant modulus in the machine direction of at least 150,000 psi. As was discussed in the response to the last Office Action, this lower limit of 150,000 psi does not represent a mere experimental "tweaking" of the film in order to ascertain optimum operating conditions. Rather, Applicant's data, which can be provided in the form of an affidavit if necessary, clearly show that a sufficiently high modulus is required to provide a film which is useable in point of sale printers. Specifically, throughout the development of the present inventive composite none of the numerous films which were produced having a modulus of less than 150,000 psi worked. They either jammed in the printer or could not be cut following printing. It was not until the Applicant recognized the criticality of a relatively thin, high modulus film that a useful composite was achieved. Thus, although the films of Matsui may be useful for some printing applications, they cannot service as drop-in replacements for conventional paper receipts in the manner of the present claimed composites. Accordingly, it is requested that the Examiner reconsider and withdraw the present rejection.

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Response dated 02/15/08
Reply to Office Action of 12/11/07

Thus, it is submitted that the present case is in condition for allowance and such action is respectfully requested.

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As shown by the representative stress–strain plot for a typical brittle polymer in Figure 4.18, only the initial portion of the plot follows Hookean behavior. The point at which stress begins to deviate from a linear stress–strain relation is called the *proportional limit*. This normally occurs before 1% strain. Therefore, to designate a value for the modulus, a convenient procedural definition must be adopted. Consequently, the initial slope of the stress–strain curve is called the *initial* modulus. Alternately, a line may be drawn from the origin to some convenient point along the stress–strain curve, for example, at 1% strain. This line defines a secant and the slope defines the *secant modulus*, the 1% secant modulus in this case. The modulus, or the compliance, is a *material property* that is a function of both temperature and the time scale of the deformation.

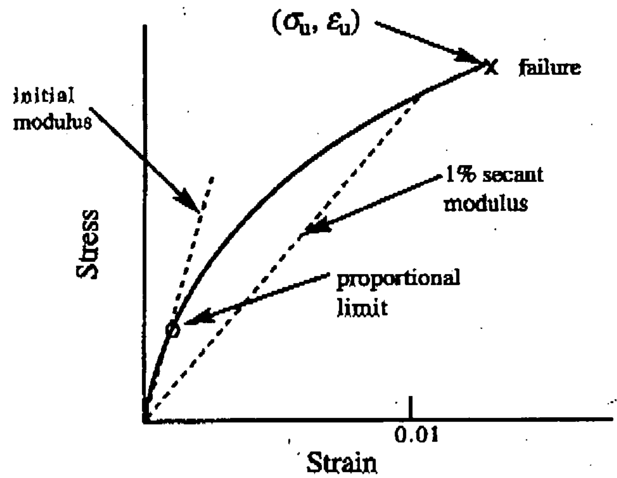

Figure 4.18. Representative stress–strain curve for a polymer undergoing brittle failure.

Figure 4.19 shows a representative plot of modulus versus temperature. At temperatures below T_g, all glassy materials, polymeric as well as low-molecular-weight substances, have approximately the same value of modulus (ca. 10^9 GPa). At first, this modulus slowly decreases with increasing temperature and then rapidly decreases in the region of T_g. For low-molecular-weight materials, modulus continues to fall rapidly with increasing temperature. For high-molecular-weight amorphous polymers, modulus drops to a secondary plateau region (approximately